

## **COP 6726 New Directions in Database Systems**

**Credits:** 3 credits

**Textbook, title, author, and year:** Data Mining: Concepts and Techniques, Third Edition, Jiawei Han, Micheline Kamber, Jian Pei ,Morgan Kaufmann, 2011

**Reference materials:** Spatial Databases: A Tour, Shashi Shekhar, Sanjay Chawla, Pearson, 2003

### **Specific course information:**

**Catalog description:** In-depth coverage of new trends in database systems, query languages, and data analytics. Topics include recent research topics in spatio-temporal database systems, spatio-temporal network database systems, data analytics, and optimization techniques.

**Prerequisites:** Familiarity with database systems

**Specific goals for the course:** The main objectives of this class include: 1) understanding new trends in database systems and data analytics, 2) identifying the fundamental concepts and key issues in research problems, and 3) discussing and developing new ideas.

This course helps students learn the fundamental concepts of database systems and data analytics, develop core research skills of literature review, communicate analysis via presentation and project, and evaluate new ideas. Ph.D. students in this course may benefit from analyzing research papers relevant to their projects. Undergraduate students and M.S. students in the course may benefit from projects and term papers similar to those for their thesis requirements.

### **Brief list of topics to be covered:**

1. Introduction to Database Systems
2. Data warehousing and Data Mining
3. Spatial and Spatio-temporal Database Systems
4. Spatial Query, Indexes, and Optimization
5. Spatial and Spatio-temporal Network Database Systems
6. Graph Algorithms, Analytics, and Optimization
7. Data Pattern Analysis
8. Data Partitioning and Clustering